DEVELOPMENT OF *LYCORIELLA INGENUA* AND *BRADYSIA IMPATIENS* ON DIFFERENT PHASES OF AGARICUS COMPOSTS

SÁNDOR KECSKEMÉTI[1], JÓZSEF FAIL[2], ANDRÁS GEÖSEL[1]

[1]Szent István University, Faculty of Horticultural Sciences, Department of Vegetable and Mushroom Growing, Ménesi Street 44., Budapest, Hungary
[2]Szent István University, Faculty of Horticultural Sciences, Department of Entomology, Ménesi Street 44., Budapest, Hungary
kecskemeti.sandor01@gmail.com

Fungus gnats are abundant all around the world, excluding places with extreme climate, like arid deserts and frozen wastelands. They dwell in damp soil, feeding on organic debris and on fungi hyphae, but can also be found in manure piles or under the bark of trees. Most species are not considered harmful in agriculture but some can cause damage mostly in protected crops and in mushroom houses. In mushroom production, the fungus gnats are regarded as the most important pests. The damage caused by them can lead to dire yield loss and low-quality product, which results in huge crop losses for the farmers. The two most commonly found species in Hungarian mushroom farms are *Lycoriella ingenua* (DUFOUR, 1839) and *Bradysia impatiens* (JOHANNSEN, 1912) from the family *Sciaridae*. The gnats proliferate rapidly in mushroom cultivation, which means that the critical number of gnats which results in severe loss can be reached quickly, so maintaining their abundance is imperative.

During compost production the different phases are transported by the help of conveyer belts, wheel loaders and trucks, from which some compost unintentionally falls off, thus creating potential food source for gnats. Mushroom production requires manual labor – especially in cellars, where production takes place on individual plastic bags – that inevitably leads to some compost ending up on the floor and remaining uncollected. In this study we aimed to find out if the two most prevalent fungus gnat species can survive on the most commonly found organic matter in the mushroom industry; the compost. We compared unspawned white button mushroom compost (phase 2) and spawned compost, which has been colonized by the mycelia of *Agaricus bisporus* (phase 3). In the experimental trial we have created breeding pots that either contained phase 2 or phase 3 compost. Each treatment had 12 replicates and the breeding pots were maintained under 23°C and 85% RH in a growth chamber in the absence of light. We recorded the time the firs adults emerged in the breeding pots; the number of emerged insects per day sorted by sex; and the amount of time the whole swarming took place. We found that gnats

emerged only from phase 2 compost. Neither *Lycoriella ingenua*, nor *Bradysia impatiens* could develop into adult stage on phase 3 compost diet, furthermore, not even pupae were observed in these breeding pots. A total of 1607 adult fungus gnats emerged from pots containing phase 2 compost. Out of them 653 was *Bradysia impatiens*, and 954 *Lycoriella ingenua*. The observed sex ratio for the two species was different. For *B. impatiens*, the number of females were 1.36 times greater than males, in *L. ingenua* there were 1.7 times more males than females in total. Development time was approximately 6 days for *B. impatiens* and 10 days for *L. ingenua*. We concluded that phase 3 compost, which is well interwoven with *Agaricus bisporus* mycelia, is not suitable for *Bradysia impatiens* and *Lycoriella ingenua* to complete their life cycle.